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EXAMINER	
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ART UNIT	PAPER NUMBER
2644	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/320,349	WEDGE, DONALD SCOTT	
	Examiner	Art Unit	
	Andrew Graham	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 August 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,6-14 and 18-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,6-14 and 18-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 May 1999* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's arguments filed 4/15/2005 have been fully considered but they are not persuasive.

On page 20, lines 16-17 and page 21, lines 1-5, the applicant has stated that the present examiner "failed to indicate if there was any error in Examiner McChesney's earlier search and actions regarding the allowability of the subject claims or if he had any prior knowledge of this new art" and "there is no indication that Examiner Graham did not engage in new search in the hope of finding this new art" and thus, it was "respectfully submitted the prior allowance of the subject claims be reinstated and the withdrawal thereof be withdrawn". The examiner respectfully submits, however, that MPEP 706.04 does not require such an "indication". The proposed rejection was submitted to and approved by a primary examiner, as evidenced by the stamp and signature (page 25) of the previous office action. The indicated allowability was withdrawn while pointing out that the claims being rejected were previously allowed. As such, the requirements of MPEP 706.04 were both adhered to and addressed in the previous office action.

Regarding the arguments related to the rejections under 35 U.S.C. 102 and 103, the applicant has characterized the main reference of Kinoshita stating "The ability of all participants to spek *(sic)* and listen is critical in this reference due to the nature of teleconferencing. The lack of the ability for all participants to hear the other participants would defeat the purpose of this reference". The examiner respectfully disagrees. Kinoshita explicity

discloses an embodiment of this system wherein groups of participants do not speak or hear other groups of participants (col. 18, lines 3-16). Kinoshita further teaches a system wherein each user at each terminal can selectively participate or speak in each teleconference, as well as selectively monitor or listen to each teleconference (col. 23, line 37 - col. 24, line 16).

On page 24, lines 10-11, the applicant has stated, "Kinoshita requires localization whereas the Claim 25 does not". The examiner respectfully disagrees. Claim 25 requires "a differentiation cue in the form of a differential frequency gain". The applicant's specification alternatively denotes "differential frequency gain" as "filtering" (line 8 of page 2). The applicant's specification also admits that transfer functions, or 'transform functions', include amplitude, delay, and filtering (page 6, lines 10-13). The "acoustic" transfer functions of Kinoshito by definition, as is further evidenced by the applicant's specification, also apply filtering or function-based processing. Thus, the acoustic transfer functions of Kinoshito teach the claimed 'differential frequency gain', establishing valid grounds for rejection under 35 U.S.C. 102. Alternately stated, the application of localization of Kinoshita, as noted by the applicant, is at least one form of applying differential frequency gain.

On page 25, lines 16-19, the applicant has stated, "Techniques teaches that the effective range of ILD extends to approximately 12 dB. Kinoshita, however, teaches that level differences at extreme ranges of 0 to 100% can be employed. This teaching is in contrast to

Techniques". The examiner respectfully disagrees. Techniques discloses that the effective decibel range (<12dB) can be converted to an algorithm, an example of which is given, for placing the sound image at an extreme location (page 3, bottom paragraph, implicitly based on the voltage ratio of -12dB being 0.251, which is approximately .3). Thus, the teachings of Techniques account for, rather than contrast, the intended operation of the system of Kinoshita.

On page 26, lines 1-3, the applicant has stated, "Additionally, regarding Claim 2, Kinoshita does not teach the use of a continuous signal. The cited passage in Kinoshita relied upon by the Examiner discloses the use of an utterance which is made for a certain period in time to determine its principle location". The applicant's position seems to be largely based on the further statement in lines 3-5, which relates "As shown in Fig 9D, if the time was continuous, the line for "T" would extend the length of the chart instead of its intermittent stops and starts". The examiner respectfully disagrees. The pertinent claim limitation is "a continuous broadcast", not that the "time" is continuous. Information can be in the process of being "broadcast" and still have gaps in the amplitude of the signal that do not rise above a certain threshold, such as that which is detected and shown in Figure 9D. The fact that the broadcast over this period of time in Figure 9D is 'continuous' is evidenced by Figure 9A, which shows that a sinusoid signal is input throughout the shown period of time. Further, the limitation, as claimed, does not provide context

to "continuous", allowing such a limitation to have a broad, reasonable interpretation, including period "T" over which the utterance in the signal, as noted in the cited passage, is "continued".

On page 26, lines 12-14 and 17-18, the applicant has stated, "Kinoshita discloses and teaches that each teleconference participant is able to speak and listen to the other" and "As set out above, Kinoshita requires all its terminals to have bidirectional communication lines". The examiner respectfully notes again that Kinoshita, while disclosing such bidirectional lines, the use or application of a signal through or from such lines and their corresponding source(s), is optional based on user control (col. 23, line 37 - col. 24, line 16). It is further noted that MPEP 2144.04 states that the removal of an element and its function is obvious if the function of the element is not desired. Thus, if signals are not desired or necessarily sent to a particular terminal, such as enabled by Kinoshita and alleged by the applicant as part of the "nature of avionics", the elimination of a signal output connection to such a particular terminal in Kinoshita would be obvious. This response applies to other remarks presented on page 27, line 18- page 28, line 18.

As the applicant's remarks have been addressed and refuted as presented above, the rejections of the pertinent claims, in view of any amendment(s) to said claims, have been reviewed and respectively maintained as is presented hereinbelow.

Drawings

2. The drawings submitted on May 26, 1999 remain objected to for the reasons listed on the Notice of Draftsperson's Drawing Review, form PTO-948, a copy of which was mailed to the applicant on June 19, 2003.

Claim Rejections - 35 USC § 112

3. The applicant's amendments to Claims 6, 10, and 14 in view of the previous rejections under 35 U.S.C. 112 are acknowledged and suffice to overcome the previously presented grounds of said rejections. Accordingly, said rejections are hereby withdrawn.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claims 1-2, 10, and 24-26** are rejected under 35 U.S.C. 102(b) as being anticipated by Kinoshita et al (USPN 5734724, hereafter, "Kinoshita").

Kinoshita discloses an audio communication control unit, wherein the properties of the sound images of various input audio channels are controlled in regards to their perceived spatial position.

Regarding Claim 1, Kinoshita specifies:

A method for listening to simultaneous audio signals (col. 7, lines 1-4 and 29-36), the method comprising:

receiving a first audio signal from a first source (such as TM-4, Figure 21C)(e.g. on C_1)(col. 5, lines 46-52);

adding only a first differentiation cue (col. 7, lines 22-29) to the first audio signal to produce a first stereo signal having a right first audio signal and a left first audio signal (output of 4-1L,4-1R)(col. 6, lines 11-20);

receiving a second audio signal from a second source(such as TM-4, Figure 21C) (e.g., on C4)(col. 5, lines 48-52);

producing a second stereo signal having a right second audio signal and a left second audio signal from said second audio signal (output of 4-2L,4-2R)(col. 6, lines 11-20);

providing the right first audio signal and right second audio signal (added by 5R, col. 6, lines 65-67) to a right audio transducer (53R, col. 7, lines 22-42); and

providing the left first audio signal and the left second audio signal (added by 5L, col. 6, lines 61-64) to a left audio transducer (53R, col. 7, lines 22-42);

wherein said first differentiation cue provides differentiation to allow a listener to more easily distinguish said first and second

audio signals than without said differentiation cue (col. 1, lines 26-42, col. 7, lines 14-22) and

wherein at least one of said sources does not receive said stereo signals (per Figure 21C, source at TM-1 does not hear TM-4, col. 18, lines 3-6 and col. 23, lines 15-23; user at TM-1 also does not hear own stereo signals by virtue of cancellation, col. 22, lines 28-38; thus, signals from TM-1 and TM-4 may be provided to output transducer, such as for the Listener or the user at TM-3, Figure 21-C, wherein the user at TM-1 hears neither stereo signals from TM-1 or TM-4; users may selectively monitor channels, which enables a user not to hear a summed signal, col. 24, lines 1-16)

Regarding **Claim 2**, Kinoshita in view of Techniques discloses:

the first audio signal is a continuous broadcast (col. 9, lines 27-33 of Kinoshita)

Regarding **Claim 10**, Kinoshita teaches:

a first audio input configured to receive a first monaural audio signal from a first source (e.g., C_1 from (MC) of (TM-1), col. 5, lines 29-32 and col. 7, lines 5-19 of Kinoshita);

a second audio input configured to receive a second monaural audio signal from a second source (e.g., C_2 from (MC) of (TM-2), col. 5, lines 29-32 and col. 7, lines 5-19 of Kinoshita);

a first differentiation block (e.g., 3-1, 4-1L & 4-1R collectively, col. 7, lines 22-34 of Kinoshita)

a second differentiation block (e.g., 3-2, 4-2L & 4-2R collectively, col. 7, lines 22-34 of Kinoshita)

a first channel summer (5L; col. 6, lines 61-64 of Kinoshita)

a second channel summer (5R; col. 6, lines 65-67 of Kinoshita)

the first monaural signal is provided from a radio receiver (col. 8, lines 39-44 of Kinoshita)

a microphone (MC) coupled to the communication system (e.g., at TM-3, col. 7, lines 5-7) and,

the microphone (MC)producing a third audio signal coupled to a third differentiation block (e.g., 3-3, 4-3L, and 4-3R, collectively)(col. 6, lines 8-20),

the third differentiation block providing a third differentiation cue (e.g. ILD; col. 6, lines 20-36) to the third audio signal to produce a third left channel (output of 4-3L) and a third right channel (output of third left channel 4-3R), the third left channel being coupled to the left channel summer (5L) and the third right channel being coupled to the third right channel summer(5R) (Figure 6, col. 6, lines 57-67).

wherein at least one of said sources does not receive said left channel or right channel outputs (per Figure 16, summed signal may have input terminal's audio cancelled, which means that signal from 5L,5R is not received by corresponding terminal; also, users may selectively monitor channels, which enables a user not to hear a summed signal, col. 24, lines 1-16)

Regarding **Claim 24**, Kinoshita specifies:

A method for listening to simultaneous audio signals (col. 7, lines 1-4 and 29-36), the method comprising:

receiving a first audio signal (e.g. on C_1)(col. 5, lines 46-52);

adding only a first differentiation cue (col. 7, lines 22-29) in the form of a differential time delay (col. 6, lines 44-49) to the first audio signal to produce a right first audio signal and a left first audio signal (output of 4-1L,4-1R)(col. 6, lines 11-20);

receiving a second audio signal (e.g., on C_2)(col. 5, lines 48-52);

producing a right second audio signal and a left second audio signal from said second audio signal (output of 4-2L,4-2R)(col. 6, lines 11-20);

providing the right first audio signal and right second audio signal (added by 5R, col. 6, lines 65-67) to a right audio transducer (53R, col. 7, lines 22-42); and

providing the left first audio signal and the left second audio signal (added by 5L, col. 6, lines 61-64) to a left audio transducer (53R, col. 7, lines 22-42);

wherein said first differentiation cue provides differentiation to allow a listener to more easily distinguish said first and second audio signals than without said differentiation cue (col. 1, lines 26-42, col. 7, lines 14-22)

wherein one of said sources does not receive said stereo signals (per Figure 21C, source at TM-1 does not hear TM-4, col. 18, lines 3-6 and col. 23, lines 15-23; user at TM-1 also does not hear own stereo signals by virtue of cancellation, col. 22, lines 28-38; thus, signals from TM-1 and TM-4 may be provided to output transducer, such

as for the Listener or the user at TM-3, Figure 21-C, wherein the user at TM-1 hears neither stereo signals from TM-1 or TM-4; users may selectively monitor channels, which enables a user not to hear a summed signal, col. 24, lines 1-16)

Regarding **Claim 25**, please refer above to the rejection of the similar limitations of Claim 24, noting that Kinoshita discloses an alternate sound image control parameter of an acoustic transfer function, which in terms of sinusoidal audio signals, relates the frequency, amplitude, and phase of the signal (col. 6, lines 50-56). Aspect of acoustic transfer function therefore read on "a differential frequency gain".

Regarding **Claim 26**, please refer above to the rejection of the similar limitations of Claim 24, noting that Kinoshita teaches that the communication channels may be radio channels, which reads on "in the form of a radio broadcast" and "in the form of a second radio broadcast" (col. 8, lines 39-44).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. **Claims 6-9, 11, 14, and 23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kinoshita, as applied above to Claims 24-26, in further view of Begault, D.R. et al "Techniques and Applications for Binaural Sound Manipulation in Human-Machine Interfaces", hereafter referred to as "Techniques".

Kinoshita discloses an audio communication control unit, wherein the properties of the sound images of various input audio channels are controlled in regards to their perceived spatial position.

Regarding **Claim 6**, Kinoshita specifies:

A method for listening to simultaneous audio signals (col. 7, lines 1-4 and 29-36), the method comprising:

receiving a first audio signal from a first source (such as TM-4, Figure 21C)(e.g. on C_1)(col. 5, lines 46-52);

adding only a first differentiation cue (col. 7, lines 22-29) to the first audio signal to produce a first stereo signal having a right first audio signal and a left first audio signal (output of 4-1L,4-1R)(col. 6, lines 11-20);

receiving a second audio signal from a second source(such as TM-4, Figure 21C) (e.g., on C4)(col. 5, lines 48-52);

producing a second stereo signal having a right second audio signal and a left second audio signal from said second audio signal (output of 4-2L,4-2R)(col. 6, lines 11-20);

providing the right first audio signal and right second audio signal (added by 5R, col. 6, lines 65-67) to a right audio transducer (53R, col. 7, lines 22-42); and

providing the left first audio signal and the left second audio signal (added by 5L, col. 6, lines 61-64) to a left audio transducer (53R, col. 7, lines 22-42);

wherein said first differentiation cue provides differentiation to allow a listener to more easily distinguish said first and second audio signals than without said differentiation cue (col. 1, lines 26-42, col. 7, lines 14-22)

wherein said cue is added independent of any positional information corresponding to said audio signals (target positions are desired target positions, col. 7, lines 36-44; positions may be changed, col. 59-62).

the first directionality cue comprises channel separation between the right first audio signal and the left first audio signal (col. 7, lines 23-29)

wherein the channel separation is an amplitude difference between the right first audio signal and the left first audio signal (col. 6, lines 29-36)

wherein said first differentiation cue provides differentiation to allow a listener to more easily distinguish said first and second audio signals than without said differentiation cue (col. 1, lines 26-42, col. 7, lines 14-22) and

wherein one of said sources does not receive said stereo signals (per Figure 21C, source at TM-1 does not hear TM-4, col. 18, lines 3-6 and col. 23, lines 15-23; user at TM-1 also does not hear own stereo signals by virtue of cancellation, col. 22, lines 28-38; thus,

signals from TM-1 and TM-4 may be provided to output transducer, such as for the Listener or the user at TM-3, Figure 21-C, wherein the user at TM-1 hears neither stereo signals from TM-1 or TM-4; users may selectively monitor channels, which enables a user not to hear a summed signal, col. 24, lines 1-16)

However, Kinoshita does not specify:

- an amplitude difference of at least 3 db

Techniques discloses that interaural level difference (ILD) is one mechanism of the auditory system used for localizing sound along an intracranial axis. Techniques particularly discloses that the effective range of ILD is around 10 db, at which point the sound effectively stops moving and remains at the leading or more intense ear (page 3). Figure 1 illustrates the results of a testing situation, wherein the judgment of lateral displacement is compared to a range of ILDs that extend to approximately ± 12 dB (page 4). The use of an ILD of the higher absolute value, such as approximately 10 dB, reads on "at least 3 dB".

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to apply an ILD at the higher end of the acceptable range, such as approximately 10 dB as taught by Techniques for the ILD of Kinoshita. The motivation behind such a modification would have been that such an ILD would have placed the sound image at the more extreme ends of the possible range of apparent lateral displacement.

Regarding **Claim 7**, please refer above to the rejection of the similar limitations of Claim 6, noting the components that perform the detailed functions.

More specifically, Kinoshita in view of Techniques teaches:

a first audio input configured to receive a first monaural audio signal from a first source(e.g., C_1 from (MC) of (TM-1), col. 5, lines 29-32 and col. 7, lines 5-19 of Kinoshita);

a second audio input configured to receive a second monaural audio signal from a second source(e.g., C_2 from (MC) of (TM-2), col. 5, lines 29-32 and col. 7, lines 5-19 of Kinoshita);

a first differentiation block (e.g., 3-1, 4-1L & 4-1R collectively, col. 7, lines 22-34 of Kinoshita)

a second differentiation block (e.g., 3-2, 4-2L & 4-2R collectively, col. 7, lines 22-34 of Kinoshita)

a first channel summer (5L; col. 6, lines 61-64 of Kinoshita)

a second channel summer (5R; col. 6, lines 65-67 of Kinoshita)

wherein said first differentiation cue provides differentiation to allow a listener to more easily distinguish said first and second audio signals than without said differentiation cue (col. 1, lines 26-42, col. 7, lines 14-22) and

wherein at least one of said sources does not receive said left channel or right channel outputs (per Figure 16, summed signal may have input terminal's audio cancelled, which means that signal from 5L,5R is not received by corresponding terminal; also, users may

selectively monitor channels, which enables a user not to hear a summed signal, col. 24, lines 1-16)

Regarding **Claim 8**, please refer above to the rejection of the similar limitations of Claims 1, 6, and 7, noting that Kinoshita discloses the application of control parameters to each input signal (col. 7, lines 14-44), Techniques discloses a range of ILD associated with different spatial locations that includes a plurality of those of at least 3 dB (page 4), and Kinoshita provides microphones (MC) as input components (col. 7, lines 5-7).

Regarding **Claim 9**, please refer above to the rejection of the similar limitations of Claims 6-8, noting that Kinoshita discloses that the input communication channels may be radio channels, the inherent reception components of which read on "the first monaural signal is provided from a radio receiver" (col. 8, lines 39-44).

Regarding **Claim 11**, please refer above to the rejection of the similar limitations of Claims 6 and 10.

Regarding Claim 11, Kinoshita in view of Techniques further teaches:

a detector (23B) coupled to the radio receiver (lines 40), the detector (23B) coupled to a switch (SW-2) disposed between the second audio input (C_2) and the left channel summer (5L) and the right channel summer (5R), the switch (SW-2) being responsive to a detection signal (output of 23B) produced by the detector (23B) and opening when a signal is detected (col. 9, lines 5-48; col. 27, lines 30-38).

Regarding **Claim 14**, please refer above to the rejection of the similar limitations of Claims 1, 2 and 7, noting that stereo loudspeakers (53L,53R) provide the output in the system of Kinoshita (col. 7, lines 34-36) and the simultaneous input illustrated in Figure 12.

Regarding **Claim 23**, please refer above to the rejection of the similar limitations of Claims 7 and 9.

6. **Claim 3** is rejected under 35 U.S.C. as being unpatentable over Kinoshita as applied above, and in further view of Slater (USPN 4941187).

As detailed above, Kinoshita discloses an audio communication control unit, wherein the properties of the sound images of various input audio channels are controlled in regards to their perceived spatial position.

Kinoshita does not specify:

- that the continuous broadcast is a weather report broadcast

However, certain applications, such as an airplane audio system, are known to involve a variety of audio signals. Slater discloses an intercom system for an aircraft that combines various input signals, which are then applied over sets of headphones. Communications and navigation equipment are included in this intercom system as sources of audio (col. 1, lines 15-22; col. 9, lines 13-48). One form of communication signal, useful during instrument flight, is given by

Slater as "flight watch" (col. 4, lines 1-5). Flight watch is a channel known in the art to provide aircraft with communications regarding a flight conditions such as inclement weather. Accordingly, the input of such a channel reads on "a weather report broadcast".

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to incorporate the channel inputs of Slater into the system of Kinoshita, thereby effectively implementing the spatialization system of Kinoshita in an aircraft environment. The motivation behind such a modification would have been that such an arrangement would have provided spatial differentiation between the intracabin intercom inputs, air-to-ground communications, and auxiliary music sources that correspond to such an environment. As disclosed by Slater, such signals have various priorities and desired levels of intelligibility, which would have been addressed and improved by an arrangement such as that of Kinoshita through spatialization of the inputs.

7. **Claims 12 and 13** are rejected under 35 U.S.C. as being unpatentable over Kinoshita in view of Techniques as applied above, and in further view of Slater (USPN 4941187).

As detailed above, Kinoshita discloses an audio communication control unit, wherein the properties of the sound images of various input audio channels are controlled in regards to their perceived spatial position. Techniques discloses that interaural level

difference (ILD) is one mechanism of the auditory system used for localizing sound along an intracranial axis.

Regarding **Claim 12**, please refer to the above rejection of the similar limitations of Claims 7 and 9, rejected above in view of Kinoshita and Techniques.

Kinoshita discloses the implementation of an ILD, but not a component for effecting such a level differences (col. 6, lines 29-36).

Kiroshita in view of Techniques does not specify:

- that a resistive voltage divider provides the first fixed differentiation cue

Slater discloses an intercom system for an aircraft that combines various input signals, which are then applied over sets of headphones.

However, a variety of level affecting circuits are well known in the art. Slater discloses the use of a resistive voltage divider for controlling sensitivity of a VOX circuit (col. 7, lines 32-40).

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to provide implementation of such a component to affect the associated levels of the signal lines in the system of Kinoshita reading on, "a resistive voltage divider provides a first fixed differentiation cue".

Motivation behind such an implementation would have been the minimal number of components required to effect such a level control, as well as the basic manner of making the level adjustable, which is demonstrated by Slater as applying a reference voltage to the passive

divider through a potentiometer (Figure 6). Such a voltage provider circuit is also known in the art to, for a substantially large applied load, have a voltage output ratio that remains undisturbed by the addition of a load on the driver.

Regarding **Claim 13**, please refer to the above rejection of the similar limitations of Claims 7 and 12.

8. **Claims 18-22** are rejected under 35 U.S.C. as being unpatentable over Kinoshita as applied above to Claims 24-26, and in further view of Slater (USPN 4941187) and Elko (USPN 6041127).

Kinoshita discloses an audio communication control unit, wherein the properties of the sound images of various input audio channels are controlled in regards to their perceived spatial position.

Regarding Claim 18, Kinoshita specifies:

a first differentiation block (3-1, 4-1L,4-1R collectively; col. 6, lines 8-20) for adding a first differentiation cue (col. 6, lines 21-56 and col. 7, lines 29-34) to said front microphone signal (e.g., via C_1, signal taught below in reference to Elko) to provide a first stereo signal front right channel signal (output of 4-1R) and a front left channel signal (output of 4-1L)(col. 6, lines 61-67);

a right summer (5R) for receiving said front right channel signal (col. 6, lines 65-67) (output of 4-1R);

a left summer (5L) for receiving said front left channel signal (col. 6, lines 61-64) (output of 4-1L);

a third differentiation block (3-3, 4-3L,4-3R collectively; col. 6, lines 8-20) for adding a third differentiation cue (col. 6, lines 21-56 and col. 7, lines 29-34) to said annunciator signal (e.g., via C_3, signal taught below by Slater) to provide a differentiated signal to said right summer (5R) and said left summer(5L);

a fourth differentiation block (3-4, 4-4L,4-4R collectively; col. 6, lines 8-20) for adding a fourth differentiation cue (col. 6, lines 21-56 and col. 7, lines 29-34) to a first communication input signal (Com1)(e.g., via C_4, signal taught below by Slater) to provide a differentiated signal to said right summer (5R) and said left summer (5L);

a fifth differentiation block (3-N, 4-NL, 4-NR collectively; col. 6, lines 8-20) for adding a fifth differentiation cue (col. 6, lines 21-56 and col. 7, lines 29-34) to a second communication input signal (Com2) (e.g., via C_N, as taught below by Slater) to provide a differentiated signal to said right summer (5R) and said left summer (5L);

a left output channel (output of 5L, applied to 6L, Figure 6) for providing a summed output signal from said left summer(5L);

a right output channel (output of 5R, applied to 6R, Figure 6) for providing a summed output signal from said right summer(5R),

wherein, said differentiation cues differ from one another to create an impression that sounds associated with each of said differentiation cues originates from a unique psycho-acoustic location (col. 16, lines 7-29).

Kinoshita does not clearly specify:

a front microphone signal;

at least one of a plurality of navigation and/or annunciator inputs for providing an annunciator signal;

a first communication input signal (Com1)

a second communication input signal (Com2)

However, certain applications, such as an airplane audio system, are known to involve a variety of audio signals. Slater discloses an intercom system for an aircraft.

Particularly regarding Claim 18, Slater discloses:

a front microphone signal (through jacks 14, col. 5, lines 19-21);

at least one of a plurality of navigation and/or annunciator inputs (via 104) for providing an annunciator signal ("aircraft receive audio" as part of "navigation equipment"; col. 1, lines 19-20; col. 8, lines 46-57; col. 9, lines 40-66);

a first communication input signal (Com1) (via 104, as part of "communications equipment", "selected radio frequencies", specific examples of which are given as "ATC, flight watch, and unicom"; col. 1, lines 19-20; col.4, lines 1-5; col. 8, lines 46-57; col. 9, lines 36-66)

a second communication input signal (Com2) (via 104, as part of "communications equipment", "selected radio frequencies", specific examples of which are given as "ATC, flight watch, and unicom"; col.

1, lines 19-20; col.4, lines 1-5; col. 8, lines 46-57; col. 9, lines 36-66)

Slater also discloses that passengers are provided with microphone connections through a rear panel (col. 5, lines 21-24).

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to provide the communication inputs of Slater as inputs to the system of Kinoshita, thereby effectively implementing the spatialization system of Kinoshita in an aircraft environment. The motivation behind such a modification would have been that such an arrangement would have provided spatial differentiation between the intracabin intercom inputs, air-to-ground communications, and auxiliary music sources.

Kinoshita in view of Slater does not disclose:

- a plurality of front microphone inputs, including a first microphone input and a second microphone input for producing a front microphone signal;

However, direction microphones utilizing the inputs of multiple microphones are known in the art. Elko discloses an adaptive microphone array that enables the received sound field to be adjusted, thereby improving the signal-to-noise ratio of an input signal.

Regarding Claim 18, Elko particularly discloses:

a plurality of front microphone inputs (electrical connections to 1,3)(col. 5, lines 9-15; col. 6, lines 58-67; col. 7, lines 1-10);

including a first microphone input (from 1) and a second microphone input (from 3) for producing a front microphone signal (forward cardioid, output of 7) (col. 5, lines 9-12);

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to implement the dual input microphone system of Elko for the various pilot and cabin microphones in the combined system of Kinoshita in view of Slater. The motivation behind such a modification would have been that such input microphone arrangements would have enabled noise to be directionally excluded from the input provided to the intercom and communication system of Kinoshita in view of Slater. Slater provides an approach to decreasing noise; the at least two microphone input shaping of Elko would have provided an additional manner for handling and preventing such noise. Such cardioid patterns are known in the art for, by definition, having a decreased sensitivity in an input direction, a direction which is disclosed by Elko as being that of a noise source.

Regarding **Claim 19**, Kinoshita in view of Slater and Elko specify:

a summer (7 of Elko) summing said first (from 1) and said second microphone (from 3) inputs to produce said front microphone signal (front cardioid)(Figure 5, Elko; col. 6, lines 58-66).

Regarding **Claim 20**, Kinoshita in view of Slater and Elko specify:

a plurality of back inputs (col. 5, lines 21-24 of Slater; col. 5, lines 9-15; col. 6, lines 58-67; col. 7, lines 1-10 of Elko);

including a third microphone input (e.g., from 1 of Elko of a rear passenger microphone of Slater) and a second microphone input (e.g., from 3 of Elko in the rear passenger microphone of Slater) for producing a back microphone signal (forward cardioid, output of 7 of Elko) (col. 5, lines 9-12 of Elko);

a differentiation block (3-2, 4-2L,4-2R collectively; col. 6, lines 8-20 of Kinoshita) for adding a second differentiation cue (col. 6, lines 21-56 and col. 7, lines 29-34) to said back microphone signal (e.g., via C_2, for rear microphone signal as taught by Slater)

to provide a back right channel signal (output from 4-2R of Kinoshita) to said right summer (5R of Kinoshita) and a back left channel signal (from 4-2L of Kinoshita) to said left summer (5L of Kinoshita);

Regarding **Claim 21**, please refer above to the similar limitation of Claim 19, noting again that Slater discloses a rear passenger microphone.

Regarding **Claim 22**, Kinoshita in view of Slater and Elko specify:

an input for an automatically mutable stereo entertainment system (col. 8, lines 63-68; col. 9, lines 1-12 of Slater) for providing a first input (such as to 34a of Slater) to said left summer (34a of Slater) and a second input (such as to 34b of Slater) to said right summer(34b of Slater).

Conclusion

9. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Nilsson, "Electric Circuits" pages 42-43, evidences that certain properties of resistive voltage divider networks are known in the art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Graham whose telephone number is 571-272-7517. The examiner can normally be reached on Monday-Friday, 8:30 AM to 5:00 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Andrew Graham
Examiner
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ag
October 31, 2005

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